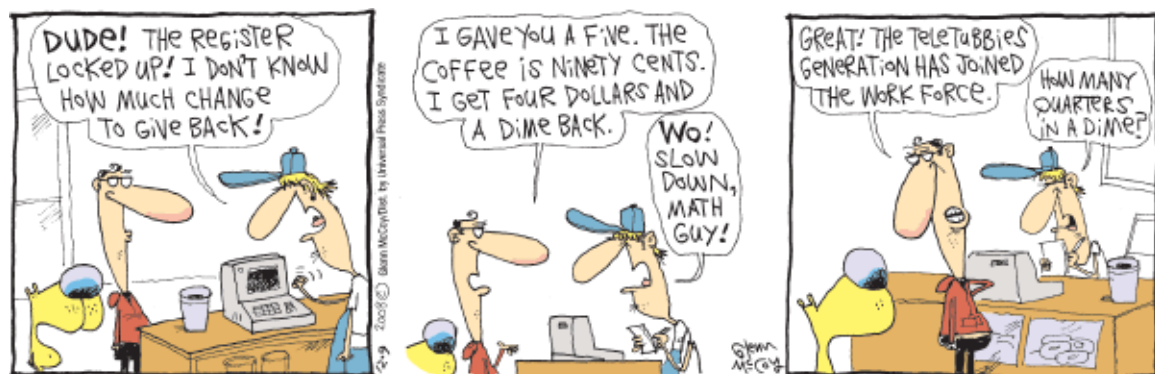


Acute Angle	Opposite Side	Adjacent Side	Hypotenuse

Sine (Angle) =

Cosine Angle=

Tangent (Angle) =



SOHCAHTOA!

(Handel's Hallelujah Chorus)

Soh Cah Toa!
Soh Cah Toa!
Learn it, and use it!
Soh Cah Toa!

Sine is opposite over hypotenuse.
Soh Cah Toa
Soh Cah Toa
Learn it, and use it!

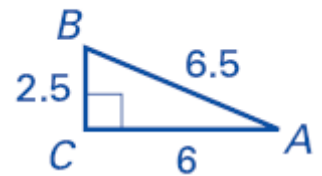
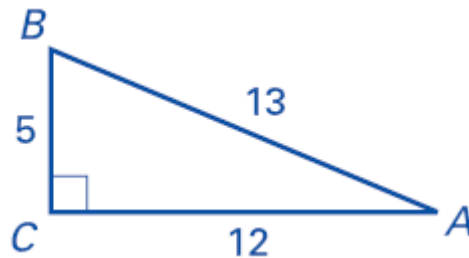
Cosine is adjacent over hypotenuse.
Soh Cah Toa
Soh Cah Toa
Learn it, and use it!

Tangent is opposite over adjacent!
Soh Cah Toa
Soh Cah Toa

SOH CAH TOA!

Examples

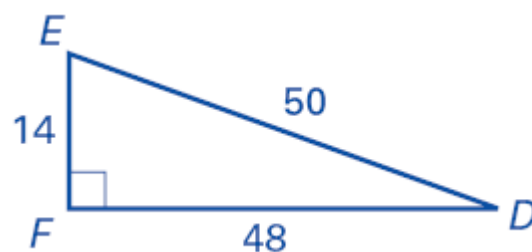
1. Compare the sine, the cosine, and the tangent ratios for $\angle A$.



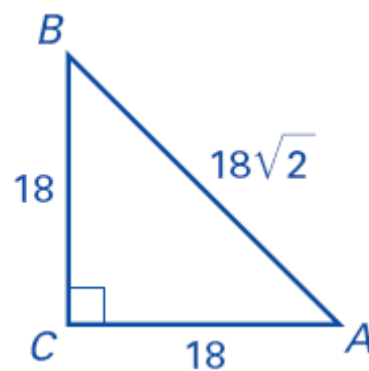
Find the sine, the cosine, and the tangent of the indicated angle.

2. $\angle D$

3. $\angle E$



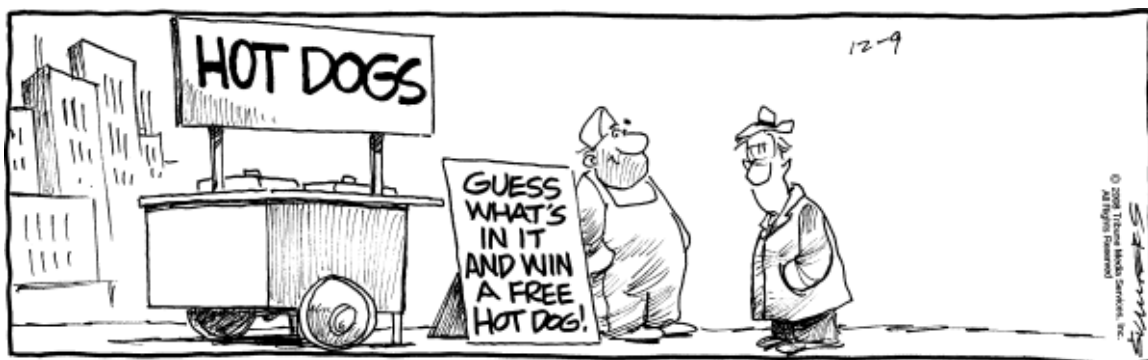
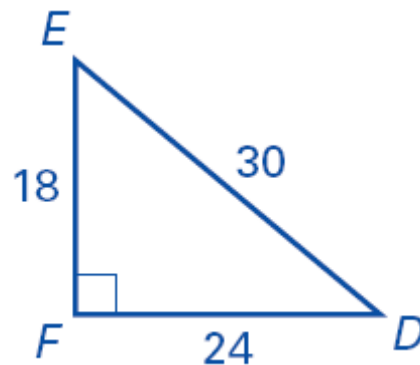
4. Find the sine, the cosine, and the tangent of $\angle A$.



Guided Practice: Find the sine, the cosine, and the tangent of the angle.

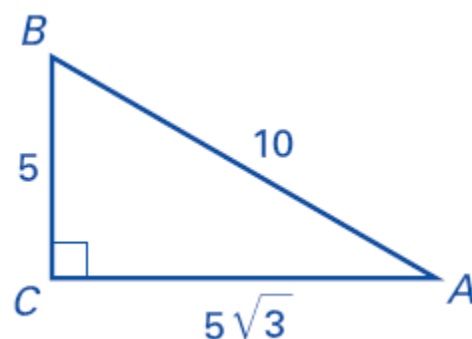
5. $\angle D$

6. $\angle E$



Examples

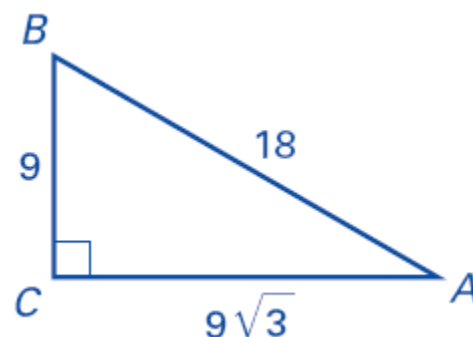
7. Find the sine, the cosine, and the tangent of $\angle A$.



8. Use a calculator to approximate the sine, cosine, and tangent of 82° .

Guided Practice.

9. Find the sine, the cosine, and the tangent of $\angle A$.



10. Use a calculator to approximate the sine, cosine, and tangent of 54° .



Angle of Elevation/Depression**Examples.**

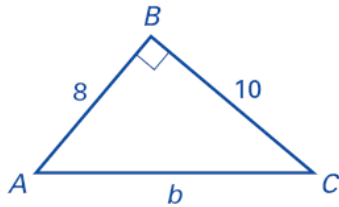
11. You are measuring the height of a building. You stand 100 feet from the base of the building. You measure the angle of elevation from a point on the ground to the top of the building to be 48° . Estimate the height of the building.

12. A driveway rises 12 feet over a distance d at an angle of 3.5° . Estimate the length of the driveway.

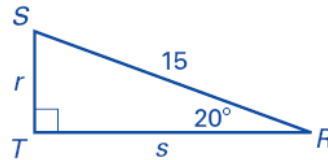
13. **Guided Practice.** You are measuring the height of a tower. You stand 154 feet from the base of the tower. You measure the angle of elevation from a point on the ground to the top of the tower to be 38° . Estimate the height of the tower.

Examples: Solve the right triangle. Round all angle measures to the nearest degree and all segment measurements to the nearest tenth.

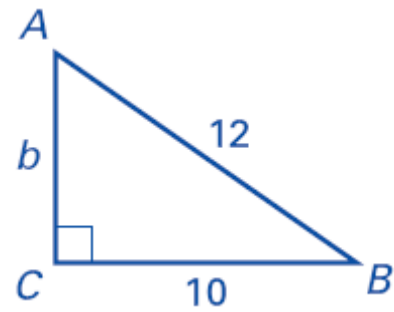
14.



15.

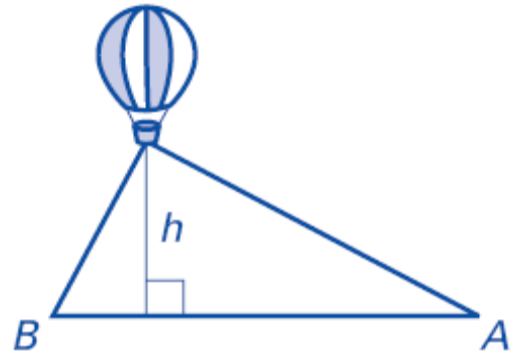


16. Guided Practice: Solve the right triangle. Round all angle measures to the nearest degree and all segment measurements to the nearest tenth.



Examples: During a flight, a hot air balloon is observed by two persons standing at points A and B as illustrated in the diagram. The angle of elevation of point A is 28° . Point A is 1.8 miles from the balloon as measured along the ground.

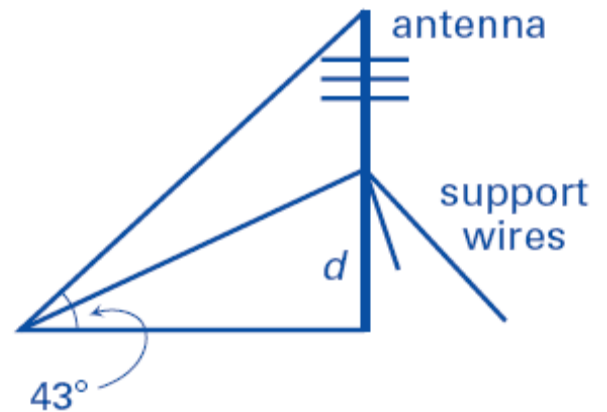
17. What is the height h of the balloon?



18. Point B is 2.8 miles from point A . Find the angle of elevation of point B .

Guided Practice: The angle of elevation of an antenna is 43° as shown in the diagram.

19. If the distance along the ground is 36 feet, find the height of the antenna.

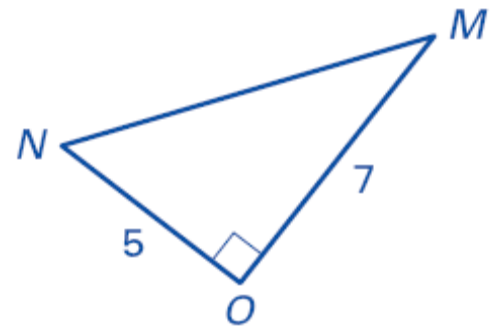


20. Support wires are attached to the antenna as shown with an angle of elevation of 29° .

Find the distance d from the bottom of the antenna to the point where the wires are attached.

21. ____ What is $m\angle M$?

- A. 30°
- B. 36°
- C. 39°
- D. 46°
- E. 55°



22. Give the definition of the sine, the cosine, and the tangent's ratio.

23. A student says that $\sin D > \sin A$ because the side lengths of $\triangle DEF$ are greater than the side lengths of $\triangle ABC$. Explain why the student is incorrect.

24. What is the minimum amount of information you need to solve a right triangle?

25. Explain what is meant by *solving* a right triangle.

True or False.

26. ____ You can solve a right triangle if you are given the lengths of any two sides.

27. ____ You can solve a right triangle if you know only the measure of one acute angle.

